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OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

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SECTION 18 REVIEW

SUBJECT: Myclobutanil on Cucurbits in Michigan

FROM: Kathryn Montague, Biologist
Thuy Nguyen, Chemist
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

Kathryn V. Montague 6/23/98
Thuy Nguyen 6/23/98

THRU: *for* Daniel Rieder, Chief
Environmental Risk Branch III
Environmental Fate and Effects Division (7507C)

Douglas J. Rieder
6/24/98

TO: Robert Forrest, PM 05
Registration Division (7505C)

A. Risk Characterization Summary

The proposed use of myclobutanil on cucurbits in the state of Michigan does not appear to pose adverse effects to birds, fish, small mammals and aquatic invertebrates. Risk to terrestrial species of plants and non-target insects could not be assessed due to lack of data; therefore, risk to plants and non-target insects remains a possibility and could be minimized by taking precautions to minimize spray drift.

B. Submission Purpose

The Michigan State Department of Agriculture has applied for a special exemption to use Nova 40W fungicide containing myclobutanil to control powdery mildew (*Sphaerotheca fuliginea*) on a total estimated 43,000 acres of cucurbits crops grown in all Michigan counties. For the July 15 through November 1, 1998 season, the maximum estimate for the total required active ingredient is 5375 lb ai (13,437 lb of Nova). This is based on two applications at 2.5 oz. (0.0625 lb ai) per acre, with a maximum treatment interval of 10 days and a 1-day interval to harvest. Applications are to be made using foliar spray, at the beginning of disease detection. Contact fungicides (copper, sulfur, chlorothalnil) are effective against powdery mildew at the site deposited, but do not provide adequate protection for the undersides of the leaves, since those fungicides are not systemic. Several systemic fungicides currently registered in the U.S. for this disease are no longer adequately effective because of resistance. Myclobutanil is proposed for use in alternation



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with Sovran (kresoxim-methyl) to implement a fungicide resistance management program. This program was proven to provide adequate fungicide coverage under lower leaf surfaces where conditions are more favorable for the development of the powdery mildew, than on the upper surfaces. This is the first request for the use of myclobutanil on cucurbit crops in Michigan.

Product Information:

Product Name: Rally 40 WSP manufactured by Rohm and Haas Co.

Active Ingredient: Myclobutanil.....40%

Inert Ingredients.....60%

Rally 40 WSP contains 3.2 lb ai/gallon of product.

C. Environmental Assessment

1. Environmental Fate and Exposure Characterization

Summary of Selected Environmental Fate Properties for Myclobutanil

Property	Range	Value used in assessment	Model
Solubility (water)	142 mg/L	142 mg/L	GENEEC
Hydrolysis $t_{1/2}$	stable at pH 5, 7 and 9	stable - (0 day)	GENEEC
Aquatic Photolysis $t_{1/2}$	stable	stable - (0 day)	GENEEC
Aerobic Soil Metabolism $t_{1/2}$	61-71 days in silt loam, but degradation rates slowed after increasing aging, and after 240 days, 34-37% of parent was still present.	see Terrestrial Field Dissipation	GENEEC FATE
Terrestrial Field Dissipation $t_{1/2}$	292 days in sandy loam, 92 days in loam soil	129 days = average of aerobic soil metabolism half-lives and terrestrial field dissipation half-lives	GENEEC FATE
Anaerobic Soil Metabolism $t_{1/2}$	no appreciable degradation in 62 days	not considered	
Aerobic Aquatic Metabolism $t_{1/2}$	no data	(0 day)	
K_{ad}	1.46, 2.39, 4.44, 7.08, 9.77	see K_{oc} values	
K_{oc}	224, 265, 581, 595, 936	581 = median	GENEEC

2. Estimated Environmental Concentrations

Aquatic:

The aquatic EECs presented below were generated using the GENEEC computer program developed by EFED. This program uses a variety of environmental fate parameters listed in above table, in conjunction with the application rate to estimate the exposure to aquatic organisms from runoff. With an application rate of 0.0625 lb a.i./A and 2 applications of 10-day interval per year, the GENEEC simulation model for ground application yields a peak EEC value of 2.3 ppb and an average 56-day EEC of 1.8 ppb.

GENEEC EECs (ppb):

INPUT VALUES

RATE (#/AC) ONE(MULT)	APPLICATIONS NO.-INTERVAL	SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCRP DEPTH(IN)
.0625 (.125)	2 7	581.0	142.0	1.0	0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
129.00	0	N/A	0.00-0.00	0.00	0

GENERIC EECs (IN PPB)

PEAK GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
2.29	2.2	2.08	1.83

Terrestrial:

The following terrestrial data were generated using the FATE computer program developed by EFED. This program uses a variety of environmental fate parameters listed in table of section C. 1., in conjunction with the application rate (0.0625 lb a.i./A and 2 applications of 7-day interval per year) to estimate the accumulation of the chemical on different terrestrial organisms.

Acute EECs (ppm):

Vegetation Type	Maximum EEC ¹	Average EEC ¹
Short grass	29 ppm	25 ppm
Tall grass	14 ppm	12 ppm
Broadleaf plants/insects	17 ppm	14 ppm
Fruits/seeds	1.8 ppm	1.6 ppm

¹ Initial concentration was the maximum Kenaga value for the vegetation type. Average EEC is for the 30-day period following the initial application.

Chronic EECs (ppm):

Vegetation Type	Maximum EEC ¹	Average EEC ¹
Short grass	10 ppm	8.9 ppm
Tall grass	4.4 ppm	3.8 ppm
Broadleaf plants/insects	5.5 ppm	4.7 ppm
Fruits/seeds	0.86 ppm	0.74 ppm

¹ Initial concentration was the mean Fletcher value for the vegetation type. Average EEC is for a 30-day period from the initial application.

3. Ecological Toxicity Data Summary

The following toxicity data has been reviewed in conjunction with the registration of myclobutanil.

Terrestrial Wildlife Toxicity Data:

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bobwhite Quail	84.5	LD ₅₀ 510 mg/Kg		0144286	C
Bobwhite Quail	84.5	LC ₅₀ >5000 ppm		0144287	C
Mallard Duck	84.5	LC ₅₀ >5000 ppm		0144287	C
Bobwhite Quail	94.2	LOEC >260 ppm	260 ppm	43087901	S
Mallard Duck	94.2	LOEC >260 ppm	260 ppm	43087902	S
Laboratory rat	91.9	Acute oral LD ₅₀ =1360 g/kg		006370	C
Laboratory rat	84.5	2-gen. Repro LOEL=1000 ppm	200 ppm	004936	C
Laboratory rat	84.5	2-gen. Systemic LOEL=200 ppm	50 ppm	004936	C

Aquatic Organism Toxicity Data:

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bluegill sunfish	84.5	96 HR LC ₅₀ =2.4 ppm		0144285	C
Rainbow trout	84.5	96 HR LC ₅₀ =4.2 ppm		0141677	C
Water flea	84.5	48 HR EC ₅₀ =11 ppm		0141678	C
Sheepshead minnow	93	96 HR LC ₅₀ =4.7 ppm		42747903	C
Eastern oyster	93	96 HR EC ₅₀ =0.68 ppm		42747901	S
Mysid	93	96-HR LC ₅₀ =0.24 ppm		42747902	C
Fathead minnow		Early life LOEC=2.2 ppm	0.98 ppm	0266119	S

4. Hazard Assessment

Hazard to Terrestrial Organisms:

Acute Risk Quotients (RQs):

Vegetation Type	Max EEC	Avian acute RQ—max	Mammal acute RQ—max ¹
Short grass	29	0.01	0.02
Tall grass	14	0.00	0.01
Broadleaf plants/insects	17	0.00	0.01
Fruits/Seeds	1.8	0.00	0.00

¹Based on a calculated mammal LC50 of 1432 ppm for a small mammal consuming 95% of its BW (LD50/% BW consumed)

No acute level of concern (LOC) is exceeded for birds and mammals from the proposed use of myclobutanil on cucurbits.

Chronic Risk Quotients (RQs):

Vegetation Type	Average EEC ¹	Avian Chronic RQ	Mammalian Chronic RQ: Reproductive Systemic
Short grass	8.9 ppm	0.03	0.04 0.18
Tall grass	3.8 ppm	0.01	0.02 0.08
Broadleaf plants/insects	4.7 ppm	0.02	0.02 0.09
Fruits/seeds	0.74 ppm	0.00	0.00 0.01

¹Average concentration over time (30 day period)—modeled using FATE program with mean Fletcher value as initial input.

No chronic LOC is exceeded for birds and mammals from the proposed use of myclobutanil on cucurbits.

Hazard to Aquatic Organisms:

Acute Risk Quotients (RQs):

Species	LC ₅₀ or EC ₅₀ (ppm)	Peak GENECC EEC (ppm)	RQ
Bluegill sunfish	2.4	0.002	0.00
Rainbow trout	4.2	0.002	0.00
Water flea	11	0.002	0.00
Sheepshead minnow	4.7	0.002	0.00
Eastern oyster	0.68	0.002	0.00
Mysid	0.24	0.002	0.01

No acute LOCs are exceeded for marine/estuarine invertebrates and freshwater mollusks from the proposed use of myclobutanil on cucurbits.

Chronic: The fish early life-stage NOEC (0.98 ppm) was compared to the 56-day GENECC value (0.002 ppm); no chronic hazard was indicated for the proposed use of myclobutanil on cucurbits.

Hazard to Terrestrial Plants: No data on toxicity of myclobutanil to terrestrial species of plants has been reviewed to date. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Hazard to Non-Target Insects Toxicity Data: No data has been received for review by the Agency regarding toxicity to non-target insects. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Hazard to Endangered Species: Based on toxicity data and predicted environmental concentrations, minimal risk is expected to endangered birds, mammals, fish, and aquatic invertebrates. The lack of terrestrial plant data and non-target insect toxicity data precludes any determination of hazard for these species groups. A list of endangered and threatened plants and insects in the state of Michigan is attached for your information.

D. Labeling Recommendations

Section 18 Label

Do not apply directly to water, or to areas below the mean high-water mark. Do not contaminate water when disposing of equipment washwater or rinsates.

Product Label

For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift or runoff from areas treated.

Endangered Species in the State of Michigan:

ALGER MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

ALLEGAN MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, KARNER BLUE	INSECT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

ALPENA MI

SPECIES	GROUP	STATUS	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

ANTRIM MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

ARENAC MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

BARRY MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, MITCHELL'S SATYR	INSECT	E	KNOWN

BAY MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

BENZIE MI

SPECIES	GROUP	STATUS	KNOWN
MONKEY-FLOWER, MICHIGAN	PLANT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

BERRIEN MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, MITCHELL'S SATYR	INSECT	E	KNOWN
POGONIA, SMALL WHORLED	PLANT	T	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

CASS MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, MITCHELL'S SATYR	INSECT	E	KNOWN

CHARLEVOIX MI

SPECIES	GROUP	STATUS	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
MONKEY-FLOWER, MICHIGAN	PLANT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

CHEBOYGAN MI

SPECIES	GROUP	STATUS	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
MONKEY-FLOWER, MICHIGAN	PLANT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

CHIPPEWA MI

SPECIES	GROUP	STATUS	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

CRAWFORD MI

SPECIES	GROUP	STATUS	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN

DELTA MI

SPECIES	GROUP	STATUS	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

EMMET MI

SPECIES	GROUP	STATUS	KNOWN
BEETLE, HUNGERFORD'S CRAWLING WATER	INSECT	E	POSSIBLE
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
MONKEY-FLOWER, MICHIGAN	PLANT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

GRAND TRAVERSE MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

HURON MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

IOSCO MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

JACKSON MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, MITCHELL'S SATYR	INSECT	E	KNOWN

KALAMAZOO MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, MITCHELL'S SATYR	INSECT	E	KNOWN

LAKE MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, KARNER BLUE	INSECT	E	KNOWN

LEELANAU MI

SPECIES	GROUP	STATUS	KNOWN
MONKEY-FLOWER, MICHIGAN	PLANT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

LIVINGSTON MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

MACKINAC MI

SPECIES	GROUP	STATUS	KNOWN
FERN, AMERICAN HART'S-TONGUE	PLANT	T	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
MONKEY-FLOWER, MICHIGAN	PLANT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

MANISTEE MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

MASON MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

MENOMINEE MI

SPECIES	GROUP	STATUS	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN

MONROE MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, KARNER BLUE	INSECT	E	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

MONTCALM MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, KARNER BLUE	INSECT	E	KNOWN

MONTMORENCY MI

SPECIES	GROUP	STATUS	KNOWN
BEETLE, HUNGERFORD'S CRAWLING WATER	INSECT	E	POSSIBLE

MUSKEGON MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, KARNER BLUE	INSECT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

NEWAYGO MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, KARNER BLUE	INSECT	E	KNOWN

OCEANA MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, KARNER BLUE	INSECT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

OTTAWA MI

SPECIES	GROUP	STATUS	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

PRESQUE ISLE MI

SPECIES	GROUP	STATUS	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

SAGINAW MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

ST. CLAIR MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

ST. JOSEPH MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, MITCHELL'S SATYR	INSECT	E	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

SCHOOLCRAFT MI

SPECIES	GROUP	STATUS	KNOWN
GOLDENROD, HOUGHTON'S	PLANT	T	KNOWN
IRIS, DWARF LAKE	PLANT	T	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

TUSCOLA MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

VAN BUREN MI

SPECIES	GROUP	STATUS	KNOWN
BUTTERFLY, MITCHELL'S SATYR	INSECT	E	KNOWN
THISTLE, PITCHER'S	PLANT	T	KNOWN

WASHTENAW MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN

WAYNE MI

SPECIES	GROUP	STATUS	KNOWN
ORCHID, EASTERN PRAIRIE FRINGED	PLANT	T	KNOWN